

Owners Manual and Set-up Guide

Genesis 2.2 Loudspeaker System

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A Message from Genesis

Congratulations! And Thank You!

You are now the owner of one of the finest loudspeaker systems in the world! The Genesis 2.2 is the result of technologies developed and refined over the past 40 years in loudspeaker design.

The G2.2 loudspeaker system was created for the music lover who knows (almost) no compromise. It is designed to reproduce music (and film) at live listening levels with virtually no restrictions on dynamic range, frequency response, or imaging capabilities. This is “*absolute fidelity*™”, the ability to reproduce the musical event faithfully, as was intended by the performer or filmmaker.

However, the G2.2 is *not* meant to reproduce music at ear-splitting levels. If you are looking for just **LOUD**, this is the wrong loudspeaker. A Ferrari and a Caterpillar may have the same price, but they are very different vehicles and you wouldn’t use your Ferrari to move gravel.

Please read this Owners Manual and Set-up Guide to get the maximum enjoyment out of your purchase. Also, if you have access to the internet, please check back at our website often. The address is www.genesisloudspeakers.com. We will put the latest updates, tips and tricks, and support for our owners on our website and in our newsletter.

Please write the purchase details of your Genesis 2.2 System here for future reference. Remember, send in your registration card to extend the limited warranty on your loudspeakers.

Bought from: _____

Date: _____

absolute fidelity



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Warranty Statement and Extended Registration Card
should be placed here

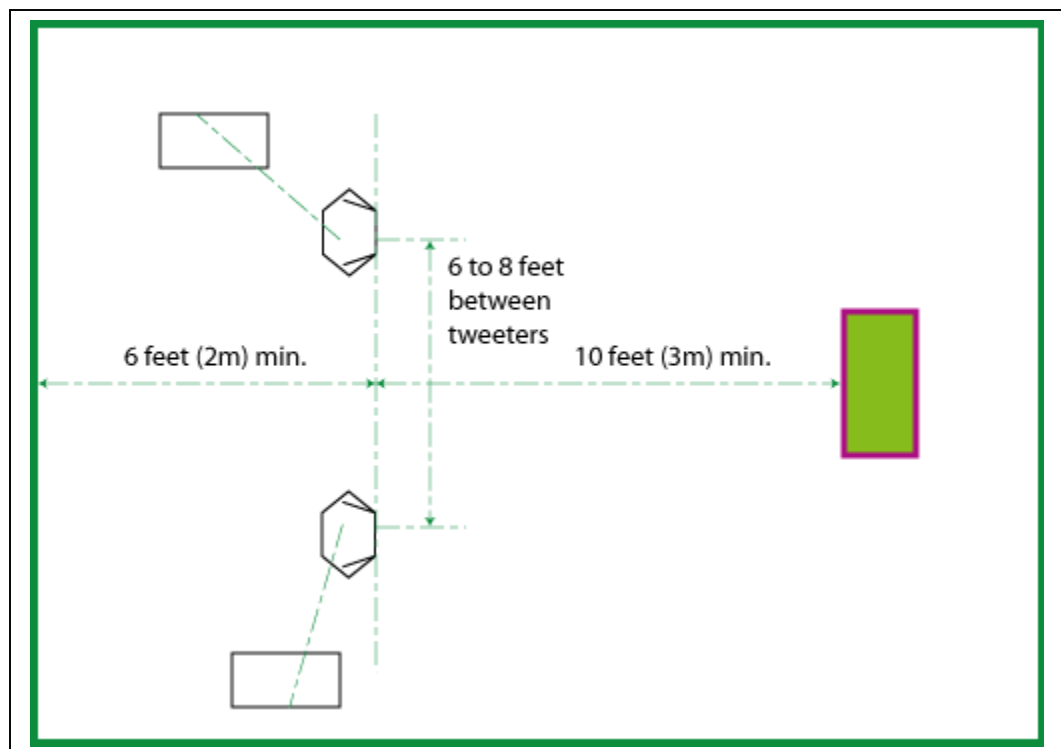
Set-up Guide

Now that you have your new Genesis 2 loudspeaker system, we realize that you can't wait to hook it up and start the music! However, this is a big, complex system and we want you to set it up correctly and more importantly, safely. So, please read this set up guide (even if your dealer is setting it up for you!) before you proceed.

Planning the Placement

Before you even have the loudspeakers delivered, it would be a good idea to make a plan of where you will place them. You will not need a huge room, but at an absolute minimum the room needs to be 16 feet (5m) wide where the speakers will be placed. You should have a minimum of at least 6 feet (2m) of space behind the speakers. The listening position should be a minimum of 10 feet (3m) from the front of the midrange ribbon to allow for proper integration of the drivers.

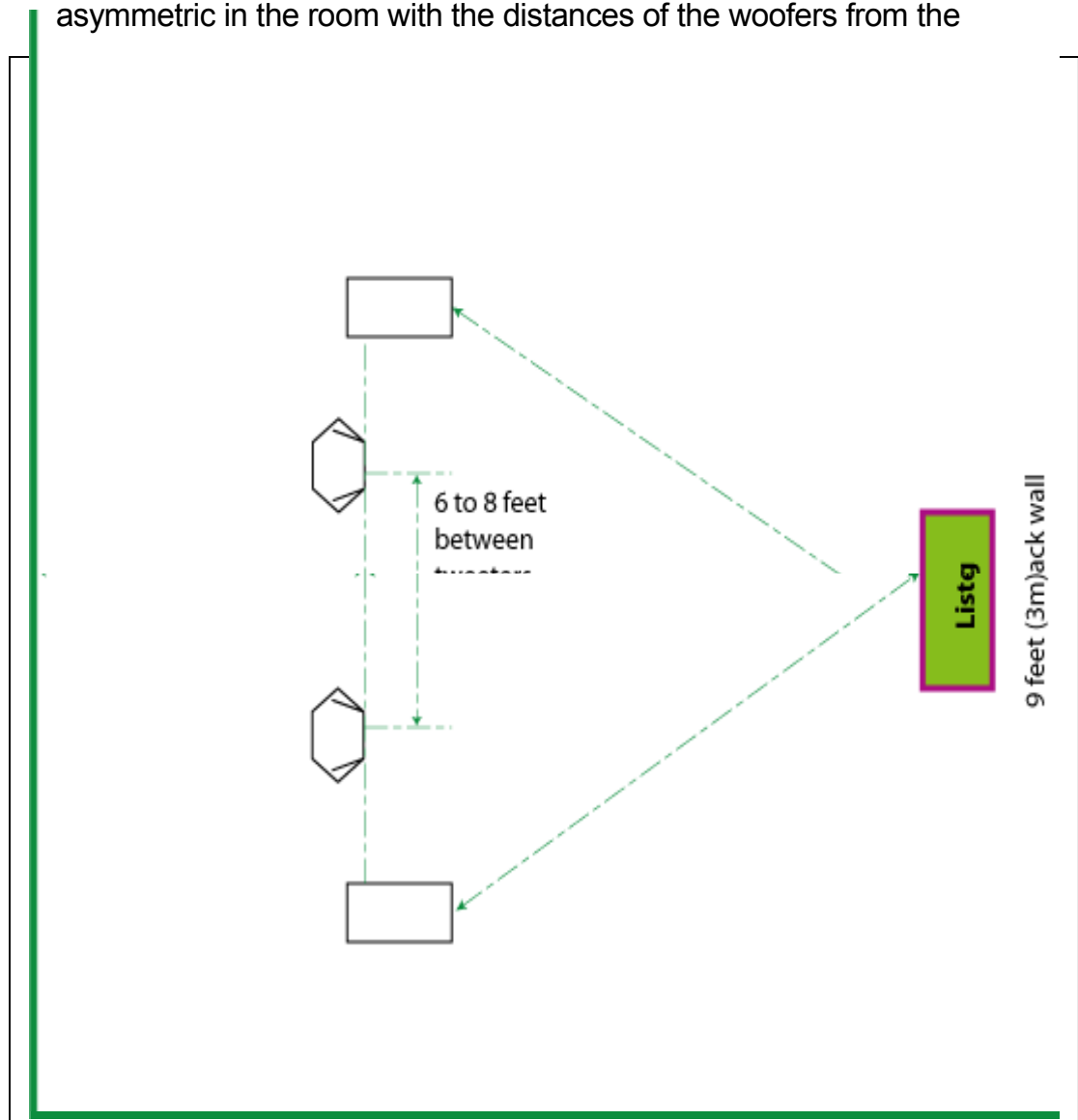
In a typical placement, the midrange/tweeter wings will be placed so that the two columns of tweeters are on the inside, and between six feet to eight feet (2m to 2.6m) apart. The woofer towers are placed behind and outside the wings with the column of woofers about 4 feet



from the midrange ribbons. In order to allow for sufficient space from the sidewalls, this dictates that the optimum room is at least 19 feet (6m) wide.

Placing the woofer towers asymmetrical but equidistance from the midrange/tweeter wings will result in better bass integration in the room. Keep the side of the woofer towers no less than 16 inches from the sidewall.

The suggestions here are typical in a minimum space. With a larger room, it is possible (and optimal) to have a layout as shown below with the midrange, tweeters and woofers equidistant from the listening position. Still, the woofer towers should be placed asymmetric in the room with the distances of the woofers from the



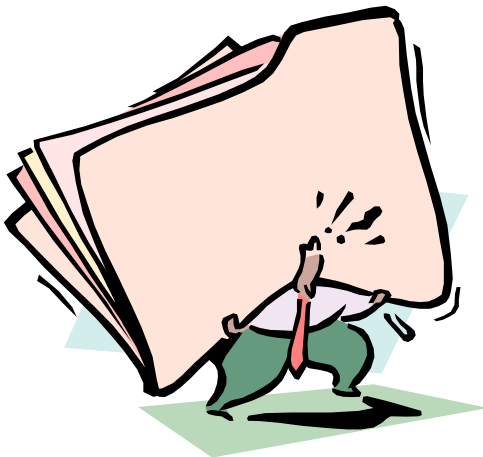
nearest wall being different.

As the room will greatly influence the sound of your system, fine-tuning adjustments in placement will be necessary. Every room will be different, with doorways, closets, wall construction and covering, etc. all making a significant impact on positioning.

Unpacking

The Genesis 2.2 system will arrive in a number of pieces. There are four large wooden shipping crates, two containing the woofer towers, two holding midrange/tweeter panels (or “wings”). There will also be a pallet of cardboard boxes holding the acoustic suspension system, the various modules of the servo-controlled bass amplifier, and a box containing the various cables. (There could also be up to three more boxes if you have the dynamic reservoir and power supply upgrades to the servo-controlled bass amplifier.)

To remove the contents of all the crates, you will need help. The G2.2 loudspeaker system with crates weigh a total of 1,400 lbs. Each woofer tower weighs over 220 lbs, and each tweeter tower weighs over 150 lbs and they have to be lifted out of the shipping crates. *We are **not** liable for damage (to either the speakers or your backs!) during unpacking and setting up.*



We suggest the use of a forklift to move these crates around, and at least four strong people to un-box and position the loudspeakers. In order to remove the loudspeakers from the crates, the front and top of the crates can be removed. This is secured with screws – remove all exposed screws except the ones marked with blue paint – and the top and front can be lifted away.

With the top and front of the crate removed, each wing and tower of the loudspeaker can be carefully lifted and slid out of the crate. Before you put the speaker up on its feet, it will be necessary to install the acoustic suspension (next page).

After unpacking, we strongly suggest that the crates be dismantled, flattened and safely stored away in a cool, dry place. They will be needed should you relocate or move. It will be expensive to custom

build crates strong enough to transport these loudspeakers without damage.

Assembling the Acoustic Suspension



Acoustic Suspension under the midrange/tweeter wings

A unique feature of the Genesis 2.2 loudspeaker system is the integration of an acoustic suspension system for the loudspeaker columns. This is an essential feature of the cabinet structure – resulting in lower coloration, better definition and rock-solid imaging.

The suspension system comprises of a suspension frame made of 1-inch of solid cast acrylic, a set of Neoprene decoupling shock absorbers, and a set of steel spikes.

Should you be placing the speakers on a hardwood floor or a floor that would scratch easily, do not use “spike cups”. These defeat the purpose of having a spike in the first place! Use a copper penny – the weight of the speaker on the spike will create a depression in the penny, and this point is what will efficiently transfer vibration to the floorboards.

A couple of points to note during the assembly of the acoustic suspension system:

- 1) The triangular “hole” in the suspension frame points to the front of the speaker (towards the listener).
- 2) Do not over tighten the shock absorbers that are pre-installed on the cabinet – finger tight is sufficient. A hex-key (or allen wrench) is supplied to tighten the bolts holding the suspension frame to the shock absorbers. Again, do not over tighten these bolts.
- 3) The point of the spike should protrude through the suspension frame only far enough to couple to the floor. If on a concrete or marble floor, for example, 5mm or 1/5” is more than sufficient. If you have your speakers on a 1/2” deep pile carpet, then you will need to have the spike protrude about 3/4”.
- 4) If you need to move the loudspeaker after you have installed the spikes, do not “walk” the speaker cabinet on the spikes –

retract the spikes first. This will avoid causing damage to the acoustic suspension and to your floor.

- 5) If you have very light and resonant floorboards, you may need to place a heavy slab of marble, slate, or granite under the loudspeaker to avoid exciting the floor.

The Servo-Controlled Bass Amplifier

The included remote-controlled modular Servo-Controlled Bass Amplifier powers the woofer towers of the G2. There are three modules plus a power supply unit and numerous supplied cables in the standard configuration. Various upgrades are also available for the Servo-Controlled Bass Amplifier – please check with your dealer.



Genesis 2 Servo-Controlled Bass Amplifier
(with optional amplifier suspension for floor placement)

The parts of the amplifier are:

- 1) The electronic crossover and Control Module with left and right balanced inputs and two control outputs.
- 2) A pair of Control Interface Cables (CIC): these have 7-pin Neutrik™ connectors at each end.
- 3) A pair of Servo-Bass Interconnects (SBI) with XLR connectors at one end and a pair of banana plugs (or optionally spades) at the other end.
- 4) Two Servo-feedback Amplifier Modules with one control input, and two Neutrik 50-amp Speakon™ outputs.
- 5) Two pairs of Servo-Bass Cables (SBC) with Neutrik 50-amp Speakon™ plugs at each end.
- 6) A Power Supply for the Amplifier Modules with two Neutrik™ 20-amp PowerCon™ outlets.
- 7) A pair of Power Umbilicals with a Neutrik 20-amp Powercon plug at each end (one grey and one blue).

In the typical configuration, the Control Module, and two Servo-feedback Amplifiers are placed in a stack between the midrange/tweeter wings. The Power Supply is placed behind the stack. The standard cables supplied will work for this configuration: 9-foot (3m) Servo-Bass Cables (SBC), two-foot (0.6m) Control

Interface Cables (CIC) and 6-foot (2m) Servo-Bass Interconnects (SBI). An alternative placement option is to have the Control module in the middle, flanked by the two Servo-feedback Amplifiers, with the Servo-feedback Amplifiers closer to the woofer towers and the Control module between the midrange/tweeter wings.

First, place the stack of modules between the midrange/tweeter wings with the Control Module on the top and the whole stack on an amplifier stand. Using the supplied CIC, link the Control Module to the Servo-feedback Amplifiers. One amplifier module is for the RIGHT woofer tower and the other will be for the LEFT. You can figure out which it is by the last letter of the serial number. It does not matter which CIC is used for right and which is used for left. However, one is marked with a red ring and the other is marked with a white ring for convenience.



Use the SBC to connect the woofer towers to the woofer amplifier. Each end of the cable is clearly marked, AMPLIFIER or SPEAKER. It does not matter which connector is attached to which as long as the correct amplifier module is used for the left and right towers. It does not matter which SBC is used for the left or the right; however, one is marked with AMPLIFIER or SPEAKER in red lettering, and the other in white lettering.

When you connect the woofer tower outputs pay close attention to the way the connector works. This connector is a 50 amp twist-lock Neutrik™ Speakon™. It only goes in one way and you cannot put it in wrong. However, you can fail to put it in all the way. Line up the alignment pins on the connectors, push the plug in, and twist it clockwise until the lock "clicks" in place to keep it there. By looking carefully, it will be obvious as to how it works.

At the AMPLIFIER end of the servo-bass cable, you will find a male 1/8" jack. The female end is on the chassis of the servo-bass amplifier labelled GND. These jacks are used for grounding an internal shield within the servo-bass cable. For the time being, leave this shield

disconnected. The shield ground should be used only when necessary.

Midrange/Tweeter Connections

Next, connect the mid/tweeter panels to your power amplifier using a pair of high quality loudspeaker cables (not supplied) to the 5-way binding posts. We recommend using good quality spade connectors for this job.



There are two ways to get the music signal from your system to the Servo-Controlled Bass Amplifier to drive the woofers. The first, and preferred way is to drive it using the output of the power amplifier that is driving the midrange/ tweeter panels using the supplied pair of Servo-Bass Interconnects.

The Servo-Bass Interconnect will be supplied with a pair of banana plugs at one end, and an XLR balanced male plug at the other end. The banana plugs will plug straight into the binding posts of the G2 midrange/tweeter tower inputs when you are using speaker cables with spade connectors. If your speaker cables use banana plugs, we will be able to convert your SBI to spade connectors for a nominal charge.

The XLR connector contains a specially developed internal balancing circuit that enables the power amplifier to drive the balanced input of the servo amplifier. Because of the extremely high impedance of the balancing circuit, the parallel connection places absolutely no stress on the power amplifier. *Do not use any other interconnect cable for this purpose as the high level output from your power amplifier will blow the inputs of the Control Module!* This internal circuit also allows even fully balanced power amplifiers* to be connected this way.



Servo-Bass Interconnects parallels speaker cable inputs

* Do NOT use this method of connection with Class D power amplifiers that have both +ve and -ve speaker outputs floating above ground. Some of these amplifiers have as much as 36V on their speaker "ground", and this will damage the Servo-Controlled Bass Amplifier. Use the second method of connection.

Plug the XLR end of the SBI into the Control Module and the banana plug end into the binding posts of your midrange/tweeter towers (preferred) or the output binding posts of your power amp. Each end of the SBI has a grounding alligator clip on a flying green lead. Leave this grounding clip **disconnected** for the time being. It is not necessary in most instances.

The alternative method of connecting the servo-bass amplifier to your system is to use a pair of balanced interconnects (not supplied) from your preamplifier to the servo-bass amplifier. Your preamplifier will need to have two sets of outputs, or you will need to use a high-quality Y-cable (not supplied). If you use this method of connection, your power amplifier will be driving the midrange/tweeter towers and the servo-controlled bass amplifier will be driven in parallel by your preamp.

As no power amplifier is “*straight wire with gain*”, we do not recommend this way of driving your servo-bass amplifier. The reason is that phase coherence and integration between the midrange and bass is much harder to achieve.

Control Adjustments

Your servo-bass amplifier should be turned on last. As a general rule, turn your system on starting at the source to the amplifiers, and turn it off starting at the amplifier. Plug the woofer amplifier into a power outlet*, and using the remote control, turn it on by pressing the POWER button. The display shows **ON**.

The display flashes to identify that the function that is being adjusted. When you first press one of the volume control buttons, the currently-set volume will flash. The next press will move the volume up or down. Pressing and holding the button will move the volume up or down rapidly. The volume has a range of 0 to 100. A volume setting of 40 is nominal, and that is a good place to start when making adjustments. In general, a lower bass volume setting is needed in smaller rooms.

Next, adjust the phase with the buttons marked “PHS ↑” or “PHS ↓” on the remote control. When you first press the phase up or down

* Do NOT use any power conditioners with the Genesis Servo-Controlled Bass Amplifier. We have found that every power conditioner that we have tried will restrict the dynamics of the system – except the Titan by IsoTek Systems.

button, the display will flash **PH** and then the current phase setting will be shown. The next press of the button will move the phase up or down.

Set the phase to zero as an initial setting. (If you are not driving the servo-bass amplifier as recommended using the output of the power amplifier, the phase will depend on the phase shift and group delay of your power amplifier. A typical value will be 45 to 135 degrees.)

The high-pass (**HI**) filter determines how low the woofers will play. Set this initially to 24Hz until the woofers and amplifiers break in. Then, it can be set to 18Hz. Next, adjust the low pass (**LO**) filter (how high the woofer goes). Set this to 95 using the button marked "low pass" (on the remote control).



You will notice two controls on the back of the midrange/tweeter panel. The left hand knob is a trim control for the rear tweeters. Turning this control clockwise will increase the level of the rear tweeters.

If there is not enough space behind the G2, the tweeter control can be turned down. In large rooms, the tweeter control can be turned up. Use this control if you need a bit more treble or to increase the apparent space of the soundstage. Start with this control at the twelve o'clock position.

The control on the right side is a three-position switch used to adjust the midrange. Start at position two. Position one will sound fuller in the lower midrange while position three will sound leaner and have more upper midrange.

The less obvious effect (more obvious to some people!!) of the midrange control is to make the soundstage sound more forward, and change the perceived height and position of the performance. Relative to position two, you can raise the soundstage by moving to position three (it's like moving your seat forwards in the concert hall!!!)

Position two gives you a soundstage perspective of about the middle of the concert hall. Position three is more like the orchestra seats, and position one may be more like the circle seats.

While it is relatively easy to put the Genesis 2 loudspeaker system into your room and system and get a reasonable sound, it is not as easy to perfectly integrate the loudspeakers into your room, and get great music out of it. The time you will take to do this properly will be well worth it for the long-term enjoyment you will derive. This fine tuning is covered later in this manual.

Servo-Controlled Bass Amplifier Protection

The servo-bass amplifier has numerous protection circuits built in to protect both the amplifier and the woofers. If you over-drive the amplifier, it will self-protect and you will hear clicking or thumping sounds. If that happens, turn down the volume of your system to protect your hearing and your speakers.

The amplifier is designed to be current-limited to 20amps – this is more than enough to supply over 1600W transients to the woofers. However, the servo-system in the G2 is not compression or dynamic limited. Hence, it is possible to play the system too loud, and damage the woofers.

Due to the efficiency of the amplification modules, they deliver and draw current extremely quickly. Hence, you may find that a very loud bass drum thwack will cause your lights to dim, or the circuit breakers to trip if you do not supply enough power to your system.

A possible solution will be to install an additional 20amp circuit in your listening room, and purchase an additional power supply to separate the power needs of the left and right woofer towers. Also, a Dynamic Reservoir (developed for the Genesis Reference Amplifier) is available as an optional upgrade. You will only need to do this if heavy bass dims your lights.

A Word about Finish

The G2 is entirely covered in high-gloss acrylic. Acrylic was picked for its sonic properties as well as its beauty. However, acrylic is a soft material that can scratch easily.

absolute fidelity



Every G2 system is delivered with a 3-stage acrylic polish system by Novus. Do not use any other cleaners or polish on your G2 loudspeakers.

Tuning the system

Music is the best way to begin to fine-tune your setup. We suggest that video sources be used only after you have setup the system to properly reproduce music. Fine-tune your system only after at least 200 hours of play. As the loudspeaker system breaks in, it will sound better and better. Using the IsoTek Full System Enhancement CD will shortcut the 200 hours needed.

Begin with the bass level

Start with a single vocal with simple instrumental accompaniment because the sound of the human voice is more easily recognizable than many instruments and is the least complex sound to deal with.

Leave the low pass filter alone, for the moment, as it should remain set at 95 Hz, This control will be addressed later. Turn the volume control of the woofer amplifier up or down until the voice sounds correct. Whatever controls you use, turn them up and down only a little at a time. It is easy to turn it up or down too much.

Concentrate on the mid bass regions (as opposed to the very low bass in your recording) to achieve a natural blend. The voice and the music accompaniment should sound as if it were cut from one cloth, not separate.

If the voice sounds “thin” or does not have enough “chest” to its sound, turn the woofers amplifier’s volume up till it does. If you find that turning the volume up creates too much low bass, decrease the low pass filter control.

The low-pass control will raise or lower the frequency cutoff point of the woofer. Turning the low pass filter up to a higher number will extend the upper bass regions without affecting the low bass level. Some rooms may require that you set the low-pass filter to 100Hz. Do not be afraid to increase this control to give the sound more body.

Next, set the woofers using more than just a voice. Select some music that you know to have good deep bass. Using the volume control on the servo amplifier’s remote control, set the woofers for a natural and powerful bass sound. Use a symphonic piece of music if you can, or use a natural bass instrument for your guide. Try to

make it sound real. You may have to return to the vocal to make sure you have not gone too far in one direction.

If, at this point, it does not have enough mid bass, turn the low pass number to a higher position or, alternately, position the main speakers closer together in order to achieve better mid bass coupling between the main speakers. If it sounds too “fat” turn the low pass control down or adjust the volume. At this point it is suggested to use the low pass filter control until you get to the refinement stage.

Imaging and Soundstage

If your vocal selection is a well-recorded audiophile CD or LP, the performer should appear to come from behind the loudspeakers and be at the appropriate height for a standing person. If it is not, there are several remedies that will address this.

If the vocal appears to be larger than life, you should first check the system volume. Is it a volume that would be appropriate for someone actually singing in your room? If there is too much volume the artist will appear too big and the opposite is true for too little volume. If the volume is set correctly and the image is still too big, toe the woofer towers in a slight amount or place them closer together and re-listen. Repeat this process till you have it right. If the voice is too low in height, turn the midrange control to the next highest position and the image of the voice will move upward slightly.

If you have the speakers only 20% away from the front wall, and you are not getting enough front to back depth (the singer not appearing behind the speaker enough) pull the midrange tweeter panels away from the front wall a little bit at a time. If you do not have them pulled far enough away, you may not have enough front to back depth. If you get the speakers much beyond 1/3 of the way into the room, it is unlikely that pulling them further away is reasonable.

Find the best compromise for your room, your tastes and your space requirements. If the speakers are too far apart you will lose the side image and if they are too close together you will have too small a center stage. We recommend you begin with six to seven feet apart as measured from tweeter to tweeter. If you are not getting proper focus on the voice, you may angle the midrange

panels about 2 to 5 degrees towards your seating position until you have a properly defined center image.

When properly set up very little sound should appear to come directly from the speaker, instead, the sound stage should extend far beyond the left and right edge of the loudspeakers and they should have tremendous front to back depth. When the recording is close miked (when the instrument or performer is very close to the recording microphone) the music may appear to come directly from the loudspeaker. This is normal. Typically, however, the sound should appear to be detached from the loudspeakers.

A simple rule of thumb to follow is that focus will be achieved by placing the speakers closer together or farther apart, and front to back depth can be adjusted by the distance from the rear wall. Further, as the system “breaks in”, the depth and width of the soundstage will increase, and so will the “smoothness” of the sound.

Phase Control

We suggested in the beginning of this manual to set the phase to zero degrees. Now that you have roughed the system in, you may want to experiment with different phase angles.

Using the remote control you can adjust the woofer's phase angle up and down in five-degree increments.

The changes are subtle and they usually affect the imaging and soundstage. Listen carefully to the positioning (in acoustic space) of the orchestral players as you change the phase control. You may notice small shifts in their apparent relationship to the other members of the orchestra. Do not expect them to actually move. Expect minute changes in the soundstage, the apparent width of the stage, your ability to distinguish individual players etc. If you reach a phase shift of ninety degrees you have probably gone too far. Using the recommended connection, the phase shift needed is usually below ten.

The other change to listen for is coherence and timing. Adjust the phase will subtly change the relationship between the bass and the midrange. When you get the phase perfectly correct, you will find that the timing between the vocalist and the double bass “snaps” in place,

and your foot will start to tap, and you will sway to the music. This is basically what we term “PRAT” – or pace, rhythm and timing.

Further adjustments

With the woofer towers positioned in the recommended placement behind and outside the midrange tweeter panels, low bass in the room should not be a problem. Should you have too much bass, simply turn the volume down on the remote control. Too little, and the opposite will apply.

In general, the low-pass filter and the bass volume goes in opposite directions. With higher bass volume, a lower frequency for the low-pass is needed. And with lower bass volume, a higher frequency is needed for the low-pass.

In some problematic rooms a resonance may develop at one or two frequencies that is unnatural to the music. By moving the woofer towers closer to the rear wall or farther from the rear wall, the resonance may be reduced at the listener’s position. There are no absolute rules concerning problematic rooms, so do not be afraid to experiment with best woofer placement.

Ultimately, it is all about balance. You have a number of controls at hand with which to adjust the bass response, the low-pass filter frequency and woofer volume. You can also move the speakers closer together (for better coupling), and also move the woofer towers closer together, or further apart, or even move them closer to a corner of the room for more bass.

One trick that we have found to always work is NOT to have the woofer towers placed symmetrically in the listening room. When you have the woofers equidistant to the walls, there will be wall-loading which will increase the volume of some frequencies in the bass and mid-bass.

Place the left and right woofer towers equidistant from the midrange towers. However, have one woofer tower further to the side of one midrange tower, and have the other woofer tower further to the back of the other midrange tower. It may look strange, but the principle here is to position the midrange/tweeter towers for the best imaging and soundstage, and the woofer towers for the smoothest and best bass and ambience retrieval.

The Refinement stage

After following the rough setup guide above, you may not be completely satisfied with the results. We share with you here some of our observations in setting up these loudspeakers.

Make One Change At A Time

One rule of thumb you should always keep in mind. Make one change at a time! Do not, for instance, change position of the speakers and make an adjustment to the amplifier all at once. Make each of these changes separately and note the difference - by listening - with each adjustment, then make the next change.

Each adjustment, in positioning, and in control adjustment will result in a subtle sonic change. Even when you are moving the midrange/tweeter panels further apart, or closer together, move one panel, listen, and then move the other panel. You may also find an asymmetric placement in-room more accurate and pleasing.

Defining the Soundstage

A common problem we find with many set-ups is a tendency to separate the speakers too far from each other. This gives an unnaturally stretched soundstage between the two speakers, and creates problems with focus. The key problem is a lack of soundstage information beyond the left and right sides of the speakers.

If you find that the sound is not spacious enough or you are not getting enough front to back depth, pull the speaker away from the front wall. This is typically preferable to separating the two speakers too far, and will almost always give you better depth and soundstage information. A word of caution though: if you move the speakers too far from the front wall you may lose the focus of the image.

A problem with the soundstage could also be caused by the recording. Try another recording if you cannot achieve what you are trying to do.

Appropriate Mid-bass/Low-bass Balance

Yet another problem is a lack of mid bass energy. In order for the appropriate amount of mid bass energy to be present, the speakers

should be close enough together to achieve proper "coupling" of the midrange ribbon driver. Coupling is desirable in the lower frequencies from the mid-bass on down. This simply means that the left and right drivers "work together" as opposed to working separately.

If you find there isn't enough deep bass, your first remedy is the volume control on the woofer amplifier. This has several limitations. First, turned up too high, you may get some distortion on very low frequencies or you may overheat the amplifier.

Push the woofer towers back towards the rear wall. This will increase the coupling of the woofers to the room. Do this procedure in small increments (approximately three inches at a time) and return often to the recordings you have used to adjust the front to back depth and soundstage properties of your system. It is easy, yet unproductive, to go too far in one direction (and if you move the woofer towers too far from the rear wall you may lose low bass extension).

Secondly, you may make the mid bass produced by the top of the woofer out of proportion with the mid bass produced by the bottom of the midrange ribbon. This would tend to sound bloated or thick in the mid bass regions.

Another good rule of thumb is to first set the volume control of the woofer towers for proper midbass rather than low bass. The theory is that if the midbass is correct, then the low bass should be very close to correct. If the midbass is proper and the low bass is still not right, here are some other suggestions.

A good balance between proper low bass extension and a deep and spacious soundstage needs to be established to optimize your new speaker's performance.

In order to achieve what the speaker is capable of we suggest you focus your efforts on a proper balance of soundstage elements that includes information beyond the left and right sides of the speakers, front to back depth well behind the speaker, excellent focus of instruments and voices with proper vertical information and mid bass fill.

A Genesis loudspeaker system correctly set up, can and should provide a soundstage that is wall to wall and with pinpoint focus,

the speakers disappearing completely on a recording containing such information.

Room Treatment

No room is perfect. To optimize your sonic presentation it may be helpful to treat your room. Here are some guidelines:

1. **Front walls.** This loudspeaker is a dipole and therefore there is sound coming from both the front and the back of the speaker. How the front wall is treated or not treated is important. Generally speaking, the Genesis loudspeakers prefer a live front wall.

By these terms we mean the amount of reflection of sound. A typical wall of glass or, brick, cement or drywall material is a reflective surface. A heavily curtained or sound proofed wall would be considered a "dead wall" or a non-reflective wall. A normal thin curtain across a window causes only a small amount of absorption.

2. **Sidewalls.** Because the speaker is a dipole it is less sensitive to the sidewalls. However, as a rule of thumb, it is a good idea to keep the speaker as far away from the sidewalls as is practical. With this in mind, it may be helpful to add some damping material or diffuser panels to the point of first reflection. This is a point on the sidewalls between the listener and the loudspeaker. It is where the sound from the loudspeaker first hits the sidewall, then bounces to the listener. This reflection is undesirable because it is slightly delayed from the original sound. This point on the sidewall can be easily determined with the help of a second person and a mirror.

Sitting in your listening position have an assistant hold a mirror up on the sidewall. Move the mirror until you can see the tweeter. This is the point of first reflection. A diffuser (see your dealer), an absorptive material or even a piece of furniture can help break up this point of first reflection.

3. **Rear wall.** In many cases it will be unnecessary to do anything with the wall behind your listening position. However, you may want to experiment with diffusers or

absorbers behind you for best sound. Absorption behind the listener is usually beneficial.

Mastering the Refinements of the system

Fine tuning an audio system is an art that will take time and patience. It can be one of the more rewarding learning experiences you will have in the pursuit of music and its enjoyment.

One of the best pieces of advice we can offer is that you take advantage of the ear's ability to identify similarities in sound. This ability is useful in fine tuning your system because if every recording you listen to has a similarity of sound (too much or too little of a certain frequency for instance) then you can be fairly certain that you have yet to perfect your set-up. Keep at it and remember to enjoy your music as you work on perfecting your set-up.

During the design stage of Genesis loudspeakers, we rely on hundreds and hundreds of hours of critical listening. There are changes we can make to the crossover that we can measure, but can hardly hear the difference. And there are changes that we can easily hear the difference, but cannot measure. It is an artform as much as a science! Setting up the audio system is the same.

If you have any questions, feel free to contact us at Genesis. Our website is the first place that you should look to for more information, but you are welcome to either send us an email, or just give us a call!

The Technology

The Genesis 2.2 loudspeaker comprises four “towers”: two midrange/tweeter wings and two bass columns. Each tower is over 6 feet tall (183cm), and the cabinet is made of a vibration damping and resonance-control acrylic/composite sandwich material. The tweeters and midrange ribbon are mounted on a solid 1.5-inch slab of high-hardness cast acrylic.

The rationale for the four-tower system separating the woofers from the midrange/tweeters is to allow the placement of the high-frequency wings to optimize imaging and soundstage, and the placement of the woofer towers to optimize in-room bass response.

Design Philosophy

Nothing has changed in theoretical acoustics since Lord Rayleigh’s original book on acoustics published in 1877. There are still only two proper ways for a transducer to propagate sound in a room: a point source and a line source. Anything else, or everything in between, is a compromise.



John William Strutt Lord Rayleigh (1842 – 1919)

In order for all frequencies of sound from the loudspeaker to reach the listener at exactly the same time, a coherent wave front is important - not just “time-alignment” of drivers. The ideal is either an infinitely small pulsating point or a pulsating line with a size on the order of the room dimension.

Obviously, a line-source is much easier to mechanize than the ideal point source. The line-source (if large enough), can approximate the ideal, and in doing so, provide sufficient radiating area for dynamically and spatially realistic sound reproduction.

The Genesis 2.2 is a line-source that is 4 feet long (nearly the half the room’s entire height). A line source has no vertical dispersion at any frequency. Hence there is no sound bouncing from either the

floor or the ceiling. No deleterious interference from these surfaces is created (as in virtually all other kinds of speakers).

Another advantage of the line source is that the vertical spectral content of music is virtually the same throughout the length of the line source. Hence, the seating height does not matter with this speaker; unlike point source speakers where it is important for the ears to be aligned in relationship with the tweeter.

The Genesis 2.2 is also a dipole radiator. The midrange and tweeter drivers are mounted on a rigid acrylic panel with no enclosure. This has two advantages: firstly, it eliminates any enclosure or boxy colorations caused by cabinet vibrations or resonance.

Secondly, the dipole creates a cardioid pattern (like a figure-eight), which has its maximum output at the listening position and behind the speaker itself, and minimum output to the sides in the plane of the loudspeakers. This very effectively minimizes the bounce from the sidewalls.

Hence, in conjunction with the line source, the G2.2 has no first reflection from the floor, ceiling or sidewalls. The net result is that there are far fewer detail-robbing room reflections from the room than other types of loudspeakers. With fewer spurious reflections to confuse your hearing, the program source emerges more clearly. Imaging is deeper, yet more focused.

This results in a loudspeaker system that is virtually room-independent. Also, because there are no phase and frequency distorting reflections created, one can be transported into the audience of the actual concert hall where the music was recorded.

The Genesis Ribbon Tweeter

Reviewers in the Audiophile press have often remarked that the Genesis circular ribbon tweeter is the world's best. It is a one inch circular planar ribbon design crafted from an extremely thin membrane of Kapton with a photo-etched aluminium "voice coil" that is a mere 0.0005 inch thick. The entire radiating structure has less mass than the air in front of it! That is why it will accurately reproduce frequencies to 36 kHz.

The result of this design is a driver that has a rapid and uniform response to high frequencies, and has the speed of the best

ribbon/electrostatic designs without the high distortion and poor dispersion that is typically associated with them.

The G2.2 uses twelve of these tweeters configured as a vertical line source. Because the output is distributed over many drivers, each works at very low-stress. This dramatically lowers the distortions in the high frequencies.

The G2.2 also use three rear-firing tweeters per channel wired to the crossover out of phase to the front tweeters creating a dipole.

48inch midrange ribbon

We sometimes say that the midrange is a window into the mind of a composer or a singer. And indeed, the midrange is where the “magic” is in a well-recorded musical event. This is why the G2.2 loudspeaker system uses a single 48inch-long ribbon per channel as a dipolar line-source to reproduce these critical frequencies.

The midrange ribbon used in the G2.2 is manufactured to Genesis’ exacting specifications. The ribbon itself is made of a very thin layer of aluminium laminated to a substrate of mylar that is 0.001inch thick. The ribbon is then suspended in the magnetic field created by over 24 feet of barium ferrite magnets.

This results in a perfect line-source ribbon generating a continuous and perfectly coupled wave front. The benefit of this to the listener is a wide and even horizontal dispersion yielding a large and highly stable sweet spot.

As a line-source dipole, the midrange ribbon has a vertical dispersion pattern identical to that of the line array of tweeters. Thus further insulating the listener from the room’s negative effects, and enhancing the sense of spaciousness and depth.

The Servo-bass Advantage

Very few loudspeakers use servo drive, either because most designers think that it is too difficult to design, too expensive, or because of the extraordinary demands a servo system makes on the amplifier and the transducer. The history of the Genesis servo-system started from the first introduced in the legendary Infinity Servo Statik One in 1968(!) – so we know how to design and build servo systems. The technology has been constantly updated and refined over the past 40 years.

The concept of our servo bass system is an easy one to understand: It employs an accelerometer as a sensor to constantly monitor the movement of the woofer cone and continuously compares it to the input signal. This comparison circuit instantly identifies any deviation from the input and applies a corrective signal to compensate for any deviation, resulting in the virtual elimination of the inherent distortion of the woofer.

As an example, when you have a high-impact, low-bass signal that starts and stops suddenly (for example a tympani), the inertia of the woofer cone makes it slow to start moving, and then after it has started moving, the momentum of the cone makes it continue to move after the signal has stopped. The sonic result is softness, overhang, and bloat in the bass. This results in a perceived lack of tautness and definition, and a blurring of dynamic impact.

With the servo system, the circuit senses that the woofer is not moving as fast as it should, and it instantaneously applies much more current to make it move faster. When the signal stops, it predicts that the woofer will continue to move when it shouldn't be moving and applies a counter-signal to stop the woofer faster and more effectively than an open loop woofer could possibly respond.

Thus, the servo-drive reduces distortion and improves transient response by making the woofer appear to be massless. Typical non-servo woofer systems have distortion levels that exceed 10% at even moderate levels. The Genesis servo bass system reduces this distortion to below one percent at almost any output level. The system also drives the woofer to constant acceleration, which makes the frequency response of the woofer anechoically flat to the lowest frequencies.

The Woofer Tower

The transducer used in a servo system must be strong enough to withstand the high current approach of the servo, and yet delicate and light enough to react extremely quickly. The G2.2 features a total of four front- and four rear-firing 8-inch woofers per channel – a total of sixteen woofers in the system.

While the servo system is able to ensure that the driver works linearly as a perfect piston, it is unable to correct for distortion caused by cone wobble, bending, and break-up. Hence, the drivers were designed to minimize these non-linear distortions.

The woofers are a uniquely designed metal cone driver made for the Genesis servo system. Made with a cone of solid aluminium, the suspension and voicecoil have been maximized for long distortion-free excursion so as to increase dynamic range. Our aluminium cones are a magnitude stiffer than any plastic cone on the market, and virtually eliminate the problems caused by cone bending and break-up.

The lowest break-up mode (where there can be any chance of distortion at all) is at 6,000Hz – far above the 16Hz to 120Hz frequency range that these drivers operate at. Therefore, the driver is a perfect piston within the frequencies used. Thus, extremely low cone break-up distortion is inherent in the driver that is designed for the Genesis 2.2.

Unlike the midrange and the tweeters, the front and rear woofers operate in phase as a bipolar arrangement in which all sixteen operate in unison to control the air mass of the entire room. This means that the surface area of the eight cones and the large enclosure all work together in unison to produce bass output that descends evenly to below your hearing limits.

Servo-controlled Amplifier

One problem, however, of metal cones, is that of greater mass (even ones as light as the ones used in the G2.2). To overcome this, Genesis had to build an amplification system of great power, and high damping factor. The servo system also places extraordinary demands on the amplifier because the system uses enormous amounts of current to make the woofer follow the input signal. Combined with the metal cones, this means that the amplifier used must efficiently deliver extraordinarily large amounts of clean power into very low impedances.

In the Genesis 2.2, the amplifier was designed as a holistic system of woofers, integrated connecting cables, amplifiers, servo-control and remote controlled crossover circuitry. Two separate two-channel amplifier modules are used for the left and right woofer towers.

Specially designed and tuned “Dynamic Reserve” power supplies are used – one for two channels – to deliver balanced dynamics which are critical to bass accuracy. This improves the power factor

of the power supply in delivering the bass frequencies, resulting in “floorshakingly musical” bass to power the servo woofers.

A further advantage to separating the amplifier modules of the left and right woofer towers is that if you are lucky enough to have multiple 20amp circuits in your listening room, you can power each woofer tower with a separate circuit! This allows for even better transient bass dynamics. The Dynamic Reservoir (from the Genesis Reference Amplifier) can also be adopted for the Servo-Controlled Bass Amplifier, which will give even faster bass transients.

One side benefit of this powered woofer system is that almost any sized amplifier can be used to drive the mid/tweeter section of the Genesis 2.2. No longer must one choose between having an amplifier with enough power to drive the woofers, and a smaller amplifier having better spatial and tonal characters. Nevertheless, we do recommend no less than 100 watts as a minimum for the mid/tweeter sections.

The Acoustic Suspension

The suspension for each loudspeaker tower comprises three elements:

- 1) The neoprene vibration absorbers are tuned to isolate and decouple the loudspeaker cabinet for optimal imaging and bass response no matter what surface the loudspeaker sits on.
- 2) The skeletal frame acts as a tuned absorber. Made of an inch of solid acrylic, no two parts of the frame will resonate at the same frequencies. This ensures that all midrange frequencies are “dumped” below the base of the cabinet so that floor-borne vibrations do not affect the imaging and soundstage of the loudspeaker.
- 3) The spikes rigidly couple the suspension system to the floor. If you have hardwood floors and do not want to make holes in the wood, use a copper penny (instead of expensive “spike cups”) under the spike.

A pin-point suspension system is designed to pass **all** frequencies. Using a spike cup under the spike will defeat

this system. The spike passes all frequencies to the spike cup, and then depending on the diameter of the spike cup, it passes only frequencies below a particular frequency.

A copper penny gets deformed – the spike making an indentation where it meets the penny, and a little “nipple” on the other side. This still performs the same function as a pin-point suspension system, but at the same time protects your hardwood floor.

Nevertheless, despite the acoustic suspension, if you have a extremely light and resonant floorboards, the acoustic suspension may still transmit sufficient vibrations to make your floor resonate and hence muddy up the bass and the imaging. In that case, it may be necessary to place heavy marble, slate, or granite slabs (at least 100lbs per slab) under the speakers. This slab serves as a foundation on which the acoustic suspension will work.

Specifications

- Dimensions:
 - Mid/Tweeter Wing: H 75" x W 21" x D 16"
 - Woofer Tower: H 75" x W 15" x D 26"
 - Amplifier (stack): H 11" x W 17" x D 13"
 - Power Supply: H 6" x W 10" x D 12"

- Weight: 720 lbs (328kg) wing/towers
90 lbs (41kg) amplifier total

- Frequency Response: 16Hz to 36kHz, +/- 2dB

- Controls (on amplifier): Bass volume, phase,
low-pass, high-pass

- Controls (on speaker): Rear Tweeters (+/- 1 dB)
Midrange (+/- 0.75 dB)

- Input Impedance: 4 ohms (nominal)
33K ohms (amplifier)

- Sensitivity: 91 dB 1 watt 1 meter

- Amplifier Power Rating: 4 channels @500 watts each
Power Supply 1kVA per side

- Amplifier Inputs: 1pair XLR (balanced)

- Finish: Acrylic composite